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Docket 82300LMB
Customer No. 01333

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of
Krishnan Chari, et al

RANDOM ARRAY OF MICROSPHERES

Serial No. 2nd RCE of U.S. Serial No. 09/942,241

Filed 29 August 2001

Group Art Unit: 1634
Examiner: Betty J. Forman

I hereby certify that this correspondence is being deposited today with the United States Postal Service as first class mail in an envelope addressed to Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Christine Tolhurst
Christine Tolhurst

February 10, 2006
Date

Mail Stop APPEAL BRIEF-PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA. 22313-1450

Sir:

REVISED APPEAL BRIEF TRANSMITTAL

Enclosed herewith is Appellants' Revised Appeal Brief for the above-identified application in response to the Notice of Non-Compliant Appeal Brief (37 CFR 41.37).

The Commissioner is hereby authorized to charge the Revised Appeal Brief filing fee to Eastman Kodak Company Deposit Account 05-0225. A duplicate copy of this letter is enclosed.

Respectfully submitted,

Lynne M. Blank
Attorney for Appellants
Registration No. 42,334

Lynne M. Blank/ct
Telephone: 585-477-7418
Facsimile: 585-477-1148
Enclosures

If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

REVISED APPEAL BRIEF PURSUANT TO 37 C.F.R. 41.37
and 35 U.S.C. 134

This is an appeal pursuant to 35 U.S.C. §134 from the Examiner's decision rejecting all pending claims 1-24, 26-28, 30-34, 43-46, 48, and 49 as set forth in the final Office Action mailed June 21, 2005, and from the Notice of Panel Decision from Pre-Appeal Brief Review, dated October 17, 2005.

Table Of Contents

APPELLANT'S BRIEF ON APPEAL

Appellants hereby appeal to the Board of Patent Appeals and Interferences from the Examiner's Final Rejection of claims that was set forth in the Office Action mailed June 21, 2005.

A Notice of Appeal with a Pre-Appeal Brief Request for Review was timely filed September 13, 2005. The Notice of Panel Decision from Pre-Appeal Brief Review was dated October 17, 2005, extending the period for filing an Appeal Brief to November 17, 2005.

Real Party In Interest

The real party in interest is Eastman Kodak Company, assignee of the entire interest of each and every inventor.

Related Appeals And Interferences

No appeals or interferences are known which will directly affect, be directly affected by, or have bearing on the Board's decision in the pending appeal.

Status Of The Claims

Claims 1-24, 26-28, 30-34, and 43 are rejected. Claims 44-46, 48, and 49 are withdrawn pursuant to a Restriction Requirement originally set forth in the Office Action dated February 9, 2004, wherein the Examiner indicated she was withdrawing claims 44-49 from consideration as directed to a non-elected invention without allowing for Appellants' election or response. Claims 25, 29, 35-40, 47, 50, and 51 are cancelled, and claims 41 and 42 were never entered. All pending claims 1-24, 26-28, 30-34, 43-46, 48, and 49 are the subject of this appeal. The Appendix provides a clean, double-spaced copy of the claims on appeal.

Status Of Amendments

The amendment filed April 4, 2005, was entered and considered by the Examiner, and was the subject of the Final Rejection dated June 21, 2005. No further amendments have been filed.

Summary of Claimed Subject Matter

Claim 1 is directed to a coating composition for use in a microarray as described at page 5, lines 20-26, wherein the coating composition consists of a single layer of microspheres (page 5, line 20, - page 6, line 12; page 6, line 29, - page 7, line 20) randomly dispersed (page 5, lines 16-26; page 12, lines 1-5, and 10-28; and Figs. 4A and 4B) with a uniform density (Ex. 2, page 11, line 1, - page 12, line 5; Figs. 2A, 4A, and 4B) in a fluid on a substrate, wherein the fluid contains a coating aid and a gelling agent (page 5, lines 1-15), and wherein the gelling agent forms an immobilizing gel (page 4, line 20 - page 5, line 15).

Claim 27 is directed to a microarray comprising a substrate coated with a composition consisting of a gel (page 4, line 20 - page 5, line 15) containing a single layer of microspheres (page 5, line 20, - page 6, line 12; page 6, line 29, - page 7, line 20) randomly distributed (page 5, lines 16-26; page 12, lines 1-5, and 10-28; Figs. 4A and 4B) with a uniform density (Ex. 2, page 11, line 1, - page 12, line 5; Figs. 2A, 4A, and 4B) on the substrate, wherein the gel comprises a coating aid and a gelling agent (page 5, lines 1-15).

Claim 44 (withdrawn) is directed to a method of making a microarray comprising the steps of providing a substrate; and coating on the substrate (page 6, lines 13-18) a composition consisting of a single layer of microspheres (page 5, line 20, - page 6, line 12; and page 6, line 29, - page 7, line 20) randomly distributed (page 5, lines 16-26; page 12, lines 1-5, and 10-28; and Figs. 4A and 4B) with a uniform density (Ex. 2, page 11, line 1, - page 12, line 5, and Figs. 2A, 4A, and 4B) in a gel, wherein the gel is formed from gelation of a fluid containing a coating aid and a gelling agent (page 5, lines 1-15), wherein said composition is fluid during coating and the gelling agent undergoes thermal sol-to-gel transition (page 4, lines 20-29; Ex. 1, page , line 1, - page 10, line 7) and immobilizes the microspheres randomly in a single layer on the substrate such that the

microspheres are randomly distributed (page 5, lines 16-26; page 12, lines 1-5, and 10-28; Figs. 4A and 4B) with a uniform density (Ex. 2, page 11, line 1, - page 12, line 5; Figs. 2A, 4A, and 4B).

Claim 49 is directed to a method of making a microarray, wherein the method comprises the steps of providing a substrate; coating substrate (page 6, lines 13-18) on the substrate a composition according to claim 1, wherein said composition is fluid during coating; and allowing sol-to-gel transition of the gelling agent (page 4, lines 20-29; Ex. 1, page , line 1, - page 10, line 7) to randomly immobilize (page 5, lines 16-26; page 12, lines 1-5, and 10-28; Figs. 4A and 4B) the microspheres in a single layer in the plane of the coating such that the microspheres are randomly dispersed (page 5, lines 16-26; page 12, lines 1-5, and 10-28; Figs. 4A and 4B) with a uniform density (Ex. 2, page 11, line 1, - page 12, line 5; Figs. 2A, 4A, and 4B) on the substrate.

Grounds of Rejection to be Reviewed on Appeal

The following issues are presented for review by the Board of Patent Appeals and Interferences:

1. claims 1-8, 13, 15-17, and 21 are rejected under 35 U.S.C. §102(b) over Sutton et al., U.S. Patent 5,714,340;

2. claims 1-24, 26-28, 30-34, and 43 are rejected under 35 U.S.C. §102(b) over Pierce et al., U.S. Patent 4,258,001;

3. claims 1, 2, 4, 9-12, 15-17, 21-23, 26-28, 30, 31, 33, 34, and 43 are rejected under 35 U.S.C. § 102(e) over Chari et al. (U.S. Patent 6,599,668);

4. claims 1, 2, 4, 9-12, 15-17, 21-23, 26-28, 30, 31, 33, 34, and 43 are rejected for obvious-type double patenting over claims 1-8, 15, 16, and 19 of Chari et al. (U.S. Patent 6,599,668); and

5. restriction and withdrawal of Claims 44-46, 48, and 49 from consideration.

Arguments

1. Claims 1-8, 13, 15-17, and 21 are rejected under 35 U.S.C. §102(b) over Sutton et al., U.S. Patent 5,714,340

A prima facie case of obviousness has not been established because Sutton et al. does not disclose every element of the claimed invention. Claim 1 is an independent claim from which the remainder of the rejected claims depend. Claim 1 is directed to a coating composition consisting of a single layer of microspheres randomly dispersed with a uniform density in a fluid on a substrate, wherein the fluid contains a gelling agent that forms an immobilizing gel. Sutton et al. does not teach (1) a single layer of microspheres randomly dispersed with a uniform density, or (2) use of a gelling agent that forms an immobilizing gel.

Sutton is directed to an immunoassay element for assaying ligands, wherein the element includes a layer containing a labeled ligand, a bead spreading layer, a cross-linked hydrophilic polymer layer including receptors, and a support. Neither the beads of the bead spreading layer nor the receptors of the cross-linked hydrophilic polymer layer can be compared to the microspheres of the claimed composition of claim 1. The bead spreading layer comprises a stack of beads (see col. 9, lines 59-63, and Fig. 1). The receptor bead layer comprises clusters of beads as described at col. 10, lines 1-11, referenced in the Final Office Action of June 21, 2005, at page 3, lines 3-4, and as shown in Figs. 3-5.

The receptor beads shown in Figures 3-5 of Sutton et al., and discussed at col. 10, lines 3-11, form clusters in a cross-linked hydrophilic polymer layer. In contrast, the claimed invention is directed to a coating composition consisting of a single layer of microspheres randomly dispersed with a uniform density on a substrate, as explained and exemplified in Example 2, at page 11, lines 21-28, of Appellants' specification. In Example 2, comparative Formulation 2 corresponds to Sutton et al., and results in streaks caused by aggregation of the beads in a non-Poisson distribution (see pages 11-12 of the specification, and corresponding Figs. 4A-5B).

Further demonstrated in Example 2 is the failure of Sutton et al. to disclose a gelling agent capable of forming an immobilizing gel. Formulation 2 uses a polymer designated as class II of the specific receptor zone coating polymers in

Sutton et al. at col. 6, line 55, - col. 7, line 21. The polymer does not form an immobilizing gel, resulting in non-random distribution of beads, that is, agglomeration or clustering of beads in the polymer. One skilled in the art would expect the additional disclosed classes provided by Sutton et al. to act similarly. Thus, the demonstration that class II, poly(vinyl alcohol), does not immobilize beads or microspheres rebuts the presumption, without further explanation by the Patent Office, that Sutton et al. discloses a gelling agent that forms an immobilizing gel.

As set forth above, the final rejection is clearly in error because Sutton et al. does not teach all the elements of the claimed invention. For example, Sutton et al. does not teach at least a composition consisting of a single layer of microspheres randomly dispersed with a uniform density on a substrate, or use of a gelling agent that forms an immobilizing gel. Withdrawal of the rejection is in order.

2. Claims 1-24, 26-28, 30-34, and 43 are rejected under 35 U.S.C. §102(b) over Pierce et al., U.S. Patent 4,258,001

A prima facie case of obviousness has not been established because Pierce et al. does not disclose every element of the claimed invention. In particular, Pierce et al. does not teach a single layer of microspheres as required by both independent claims 1 and 27, from which all other rejected claims depend.

Pierce et al. is directed to an element for analysis or transport of a liquid, wherein the element includes particles with an adhesive surface forming a three-dimensional structure. This is exemplified in Figures 2-14, cited in the Office Action of February 9, 2004, as exemplary of the Pierce et al. teaching. As stated at col. 6, lines 49-51, of Pierce et al., formation of a coherent, three-dimensional lattice by organopolymeric particles is "an essential feature of the invention." As shown in Fig. 3, cited by the Patent Office on page 12 of the June 21, 2005, final Office Action, layer 1 is the particulate structure on substrate 2 (see col. 21, lines 53-55), and layer 1 clearly has more than one layer of particles, in keeping with the teaching at col. 6, lines 49-51, that a three-dimensional particulate structure is

formed. Pierce et al. teaches forming a single layer having a three-dimensional array of microspheres at col. 19, lines 48-53, as follows:

> Thus, in step (b) of the method, the stable dispersion is applied to a substrate, e.g., a temporary or permanent support, and the liquid carrier of the dispersion is removed, such as by appropriate drying conditions to form, in situ, the desired three-dimensional particulate structure.

Thus, Pierce et al. forms a three-dimensional particulate structure in a single layer, as contrasted with Appellants' claimed single layer of microspheres in a fluid or gel.

As set forth above, the rejection is clearly in error because Pierce et al. does not teach all the elements of the claimed invention, such as a single layer of microspheres.

3. Claims 1, 2, 4, 9-12, 15-17, 21-23, 26-28, 30, 31, 33, 34, and 43 are rejected under 35 U.S.C. § 102(e) over Chari et al. (U.S. Patent 6,599,668)

A prima facie case of obviousness has not been established because Chari et al. does not teach every element of the claimed invention. In particular, Chari et al, is directed to a method of forming a color filter array on a surface by applying a dispersion of randomly disposed colored beads on the surface, wherein the dispersion itself forms the color filter array. Chari et al. does not teach or disclose the use of a coating aid in forming the color filter array dispersion. Appellants' independent claims 1 and 27, from which all other rejected claims depend, require a coating aid. Further, claim 27 is directed to a microarray, which term is critical to the claim, and is not a mere preamble to be ignored. Chari et al. does not teach or disclose a microarray.

As set forth above, the rejection under 35 U.S.C. § 102(e) over Chari et al. is in error and should be withdrawn because Chari et al. does not teach or disclose use of a coating aid or a microarray.

4. Claims 1, 2, 4, 9-12, 15-17, 21-23, 26-28, 30, 31, 33, 34, and 43 are rejected for obvious-type double patenting over claims 1-8, 15, 16, and 19 of Chari et al. (U.S. Patent 6,599,668)

With regard to claim 1 and claims 2, 4, 9-12, 15-17, 21-23, and 26 dependent therefrom, Appellants' claim a coating composition, while Chari et al. is directed to a method of making a color filter. A practitioner in the field of coatings would not look to art describing the manufacture of a color filter for a teaching of how to form a randomly dispersed, uniform density coating of a single layer of microspheres.

With regard to claim 27 and claims 28, 30, 31, 33, 34, and 43 dependent therefrom, Appellants' claims are directed to a microarray. Chari et al. does not teach, disclose, or suggest a microarray. Rather, Chari et al. claims a method of forming a color filter array. Color filter arrays are an entirely different field of art from microarrays. A practitioner forming a microarray would not examine color filter art for ideas or motivation. Thus, Appellants' claimed invention is distinct over the cited art.

The claimed invention is distinct from the teachings and disclosure of a method of forming a color filter array in Chari et al., and withdrawal of the obvious-type double patenting rejection is in order. However, Appellants submit that Chari et al. was commonly owned at the time the claimed subject matter of the application was invented, and would be willing to submit a Terminal Disclaimer to further prosecution if this were the only remaining issue barring allowance of the application.

5. Restriction and withdrawal of claims 44-46, 48, and 49 from consideration.

Claims 44-46, 48, and 49 are claims pertaining to methods of making a microarray that either depend from claim 1 (claim 49), or include all of the features of claim 27 (claims 44-46 and 48). These claims appropriately should have been considered with claims 1 and 27, and the claims dependent therefrom. Search and consideration of claims 44-46, 48, and 49 places no undue burden on the Examiner because the subject matter of the claims is substantially the same as claims already searched, notably claims 1 and 27, and applicable art would have been found in searching the related claims, particularly claim 27 directed to a microarray. Requiring restriction causes both the Patent Office and Appellants to research and argue substantially similar issues in multiple cases, wasting resources and time.

Appellants submit these claims are patentable over the applied art for at least the same reasons as claims 1 and 27. Rejoinder, consideration, and allowance of the withdrawn claims is in order.

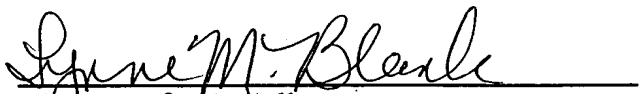
Summary

As discussed above, none of Sutton et al., Pierce et al., or Chari et al. disclose or suggest every element of the claimed invention, requiring withdrawal of the respective rejections under 35 U.S.C. § 102(e). Further, Chari et al. is not directed to the same field of art as the claimed invention, making withdrawal of the obvious-type double patenting rejection appropriate. The withdrawn claims include all the features of the elected claims, and should have been considered therewith. Rejoinder and allowance for the same reasons as the examined claims is in order.

Conclusion

For the above reasons, Appellants respectfully request that the Board of Patent Appeals and Interferences reverse the rejection by the Examiner and mandate the allowance of Claims 1-24, 26-28, 30-34, and 43, and consideration and allowance of withdrawn claims 44-46, 48, and 49.

Respectfully submitted,



Attorney for Appellants
Registration No. 42,334

Lynne M. Blank/ct
Telephone: 585-477-7418
Facsimile: 585-477-1148

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Appendix I - Claims on Appeal

1 (previously presented) A coating composition for making a microarray consisting of:

a single layer of microspheres randomly dispersed with a uniform density in a fluid on a substrate, the fluid containing a coating aid and a gelling agent, wherein the gelling agent forms an immobilizing gel.

2 (previously presented) A coating composition according to claim 1 wherein the substrate is not premarked and does not contain microwells.

3 (previously presented) A coating composition according to claim 1 wherein the random distribution complies with a Poisson distribution.

4 (previously presented) A coating composition according to claim 1 wherein the microspheres are chemically functionalized to have surface active sites.

5 (previously presented) A coating composition according to claim 4 wherein the surface active sites carry organic or inorganic attachments.

6 (previously presented) A coating composition according to claim 4 wherein the surface active sites have organic or inorganic attachments thereon that are capable of chemical or physical interaction.

7 (previously presented) A coating composition according to claim 4 wherein the surface active sites are bioactive.

8 (previously presented) A coating composition according to claim 7 wherein each of the bioactive sites interact with a nucleic acid, protein, or fragments thereof.

9 (previously presented) A coating composition according to claim 1 wherein each of the microspheres contains a signature.

10 (original) A coating composition according to claim 9 wherein the signature is comprised of an oil-soluble dye.

11 (original) A coating composition according to claim 9 wherein the signature is interrogatable by optical, magnetic, or other electromagnetic means.

12 (original) A coating composition according to claim 1 wherein the gelling agent is gelatin.

13 (original) A coating composition according to claim 1 wherein the gelling agent undergoes thermal gelation.

14 (original) A coating composition according to claim 12 wherein the gelatin is alkali pretreated gelatin.

15 (original) A coating composition according to claim 1 wherein the microspheres have a mean diameter between 1 and 50 microns.

16 (original) A coating composition according to claim 1 wherein the microspheres have a mean diameter between 3 and 30 microns.

17 (original) A coating composition according to claim 1 wherein the microspheres have a mean diameter between 5 and 20 microns.

18 (previously presented) A coating composition according to claim 1 wherein the microspheres are in a concentration between 100 and 1 million microspheres per centimeter squared.

19 (previously presented) A coating composition according to claim 1 wherein the microspheres are in a concentration between 1000 and 200,000 microspheres per centimeter squared.

20 (previously presented) A coating composition according to claim 1 wherein the microspheres are in a concentration between 10,000 and 100,000 microspheres per centimeter squared.

21 (original) A coating composition according to claim 1 wherein the microspheres comprise a synthetic or natural polymeric material.

22 (original) A coating composition according to claim 21 wherein the polymeric material is an amorphous polymer.

23 (original) A coating composition according to claim 22 wherein the amorphous polymer is polystyrene.

24 (previously presented) A coating composition according to claim 4 wherein at least one of the surface active sites of each of the microspheres comprises a functionality independently selected from the group consisting of carboxy, amine, epoxy, hydrazine, aldehyde and combinations thereof.

25 (canceled)

26 (original) A coating composition according to claim 1 wherein the microspheres are prepared by emulsion polymerization or limited coalescence.

27 (previously presented) A microarray comprising:

a substrate coated with a composition consisting of a gel containing a single layer of microspheres randomly distributed with a uniform density on the substrate, wherein the gel comprises a coating aid and a gelling agent.

28 (original) A microarray according to claim 27 wherein the substrate is free of receptors designed to physically or chemically interact with the microspheres.

29 (cancelled)

30 (original) A microarray according to claim 27 wherein the gelling agent is gelatin.

31 (original) A microarray according to claim 27 wherein the microspheres bear chemically active sites.

32 (previously presented) A microarray according to claim 31 wherein the chemically active sites are bioactive.

33 (original) A microarray according to claim 27 wherein the substrate comprises glass, plastic, cellulose acetate, or polyethyleneterephthalate.

34 (previously presented) A microarray according to claim 27 wherein the substrate is flexible.

35-40 (canceled)

41. (not entered) A coating composition for making a random microarray comprising:

microspheres dispersed in a fluid, the fluid containing a coating aid and a gelling agent or a precursor to a gelling agent, said fluid being capable of sol-to-gel transition; and wherein the microspheres are immobilized at random positions on a substrate when said sol-to-gel transition occurs.

42. (not entered) A microarray comprising:

a substrate coated with a composition comprising microspheres dispersed in a fluid, the fluid containing a coating aid and a gelling agent or a precursor to a gelling agent, said fluid being capable of sol-to-gel transition; and wherein the microspheres are immobilized at random positions on the substrate when said sol-to-gel transition occurs.

43 (previously presented) A microarray according to claim 27 wherein the substrate is not premarked and does not contain microwells.

44 (withdrawn) A method of making a microarray, comprising the steps of:

providing a substrate; and

coating on the substrate a composition consisting of a single layer of microspheres randomly distributed with a uniform density in a gel, wherein the gel is formed from gelation of a fluid containing a coating aid and a gelling agent,

wherein said composition is fluid during coating and the gelling agent undergoes thermal sol-to-gel transition and immobilizes the microspheres randomly in a single layer on the substrate such that the microspheres are randomly distributed with a uniform density.

45 (withdrawn) A method according to claim 44 wherein said sol-gel transition occurs without the coating undergoing a drying process.

46 (withdrawn) A method according to claim 44 wherein the gelling agent is gelatin.

47 (cancelled)

48 (withdrawn) A method according to claim 44 wherein the composition is coated on the substrate by knife coating, blade coating, or slot coating.

49 (withdrawn) A method of making a microarray, comprising the steps of:

providing a substrate;

coating on the substrate a composition according to claim 1, wherein said composition is fluid during coating; and

allowing sol-to-gel transition of the gelling agent to randomly immobilize the microspheres in a single layer in the plane of the coating such that the microspheres are randomly dispersed with a uniform density on the substrate.

50 (canceled)

51 (canceled)

Appendix II - Evidence

None

Appendix III – Related Proceedings

None